

## Claims

- [c1] A risk-informed method for safety analyses of nuclear power generating systems, said method comprising:
- ordering events by an initiating event frequency;
  - defining an initiating event frequency threshold value;
  - defining acceptance criteria having an adjusted amount of conservatism, wherein the amount of conservatism is a function of the initiating event frequency; and
  - analyzing an event by a deterministic safety analysis methodology when the event has an event initiating frequency at or above the threshold value; or analyzing an event by a probabilistic risk assessment methodology when the event has an event initiating frequency below the threshold value.
- [c2] A method in accordance with Claim 1 further comprising determining an amount of conservatism used in the deterministic safety analysis methodology, wherein the amount of conservatism is a function of the initiating event frequency.
- [c3] A method in accordance with Claim 2 further comprising:
- identifying additional system failures that are not a direct consequence of the initiating event;
  - defining a total threshold frequency for the combination of the initiating event frequency and the additional failure frequency; and
  - adding additional system failures to the safety analysis, one at a time, until a total frequency of an event plus additional failures is less than the total threshold frequency when the initiating event frequency is above the total threshold frequency.
- [c4] A method in accordance with Claim 2 wherein determining an amount of conservatism used in the deterministic safety analysis methodology comprises developing at least one deterministic safety analysis methodology containing a predetermined amount of conservatism based on the initiating event frequency, wherein the predetermined amount of conservatism used in a deterministic safety analysis methodology is a function of the difference between the

initiating event frequency and the initiating event frequency threshold value.

[c5] A method in accordance with Claim 1 wherein defining acceptance criteria having an adjusted amount of conservatism comprises developing at least one acceptance criteria containing a predetermined amount of conservative based on the initiating event frequency, wherein the predetermined amount of conservatism for an acceptance criteria is a function of the difference between the initiating event frequency and the initiating event frequency threshold value.

[c6] A system for performing risk-informed safety analyses of nuclear power generating systems, said system comprising a computer configured to:  
order events by an initiating event frequency;  
define an initiating event frequency threshold value;  
define acceptance criteria having an adjusted amount of conservatism, wherein the amount of conservatism is a function of the initiating event frequency; and  
analyze an event by a deterministic safety analysis methodology when the event has an event initiating frequency at or above the threshold value; or  
analyze an event by a probabilistic risk assessment methodology when the event has an event initiating frequency below the threshold value.

[c7] A system in accordance with Claim 6 wherein said computer is further configured to determine an amount of conservatism used in the deterministic safety analysis methodology, wherein the amount of conservatism is a function of the initiating event frequency.

[c8] A system in accordance with Claim 7 wherein said computer is further configured to:  
identify additional system failures that are not a direct consequence of the initiating event;  
define a total threshold frequency for the combination of the initiating event frequency and the additional failure frequency; and  
add additional system failures to the safety analysis, one at a time, until a total frequency of an event plus additional failures is less than the total threshold frequency when the initiating event frequency is above the total threshold frequency.

- [c9] A system in accordance with Claim 7 wherein said computer is further configured to develop at least one deterministic safety analysis methodology containing a predetermined amount of conservatism based on the initiating event frequency, wherein the predetermined amount of conservatism used in a deterministic safety analysis methodology is a function of the difference between the initiating event frequency and the initiating event frequency threshold value.
- [c10] A system in accordance with Claim 6 wherein said computer is further configured to develop at least one acceptance criteria containing a predetermined amount of conservatism based on the initiating event frequency, wherein the predetermined amount of conservatism for an acceptance criteria is a function of the difference between the initiating event frequency and the initiating event frequency threshold value.
- [c11] A computer program embodied on a computer readable medium for performing risk-informed safety analyses of nuclear power generating systems, said program comprising a code segment that:  
orders events by an initiating event frequency;  
defines an initiating event frequency threshold value;  
defines acceptance criteria having an adjusted amount of conservatism, wherein the amount of conservatism is a function of the initiating event frequency; and  
analyzes an event by a deterministic safety analysis methodology when the event has an event initiating frequency at or above the threshold value; or  
analyzes an event by a probabilistic risk assessment methodology when the event has an event initiating frequency below the threshold value.
- [c12] A computer program in accordance with Claim 11 further comprising a code segment that determines an amount of conservatism used in the deterministic safety analysis methodology, wherein the amount of conservatism is a function of the initiating event frequency.
- [c13] A computer program in accordance with Claim 12 further comprising a code segment that:  
identifies additional system failures that are not a direct consequence of the

initiating event;

defines a total threshold frequency for the combination of the initiating event frequency and the additional failure frequency; and

adds additional system failures to the safety analysis, one at a time, until a total frequency of an event plus additional failures is less than the total threshold frequency when the initiating event frequency is above the total threshold frequency.

[c14] A computer program in accordance with Claim 11 further comprising a code segment that develops at least one deterministic safety analysis methodology containing a predetermined amount of conservative based on the initiating event frequency, wherein the predetermined amount of conservatism used in a deterministic safety analysis methodology is a function of the difference between the initiating event frequency and the initiating event frequency threshold value.

[c15] A computer program in accordance with Claim 11 further comprising a code segment that develops at least one acceptance criteria containing a predetermined amount of conservative based on the initiating event frequency, wherein the predetermined amount of conservatism for an acceptance criteria is a function of the difference between the initiating event frequency and the initiating event frequency threshold value.

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